

- 1 1. A power window driving device, comprising:
 - 2 a reference-current generator, generating a reference current having a
 - 3 level which corresponds to the size of a motor current flowing into a drive motor
 - 4 for driving a power window;
 - 5 a first current generator, generating a first current which is a part of the
 - 6 reference current and corresponds to a variable quantity in the motor current;
 - 7 a second current generator, generating a second current which is a part
 - 8 of the reference current and to which adding the first current results in the
 - 9 prescribed reference current;
 - 10 a comparison signal generator, generating a comparison signal by
 - 11 converting the first current into voltage;
 - 12 a comparator, comparing the comparison signal with a reference
 - 13 voltage signal generated on the basis of the first current; and
 - 14 a reverser, stopping or reversing the drive motor based on a result of
 - 15 the comparator which determine that a steep current increase is occurred in the
 - 16 motor current,
 - 17 wherein when the first current repeats decrease and increase in excess
 - 18 of a predetermined value in a predetermined period, the second current is
 - 19 increased for a predetermined period in respective cycles of the decrease and
 - 20 the increase of the first current so that the increase of the first current is relatively
 - 21 retrained or the decrease of the first current is relatively promoted for decreasing
 - 22 a detection sensitivity to a current increase in the motor current.

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1 2. The power window driving device as set forth in claim 1, wherein the
2 second current is increased by decreasing the reference voltage signal for a
3 predetermined period in the respective cycles of the decrease and the increase
4 of the first current.

1 3. The power window driving device as set forth in claim 1, wherein a
2 capacitor is connected to a reference voltage signal source;

3 wherein in the cycle of increase of the first current, the capacitor is
4 discharged so as to flow a discharge current from the capacitor into the route of
5 the second current in a superposed condition, so that the second current is
6 increased; and

7 wherein in the cycle of decrease of the first current, the capacitor is
8 charged with a current from the reference voltage signal source so as to
9 decrease the reference voltage signal, so that the second current is increased.

1 4. The power window driving device as set forth in claim 1, further
2 comprising a rough road-mode signal generator, outputting a rough road-mode
3 signal in the cycle of increase of the first current, and stopping the rough
4 road-mode signal in the cycle of decrease of the first current,

5 wherein the second current is increased for a predetermined period
6 each time an output of the comparator is inverted from an output at a normal
7 state, while the rough road-mode signal is output.

1 5. The power window driving device as set forth in claim 4, wherein a
2 capacitor is connected to a reference voltage signal source; and

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3 wherein the capacitor is charged with a current from the reference
4 voltage signal source so as to decrease the reference voltage signal while the
5 rough road-mode signal is output when an output of the comparator is inverted
6 from the output at the normal state, so that the second current is increased.

1 6. The power window driving device as set forth in claim 4, further
2 comprising a counter, counting the number of times the output of the comparator
3 is inverted from the output at the normal state while the rough road-mode signal
4 is output,

5 wherein when the count exceeds a predetermined number of times, the
6 reverser stops or reverses the drive motor.

1 7. The power window driving device as set forth in claim 1, wherein the
2 reference voltage signal is generated from a voltage which is converted from the
3 first current by means that the ratio of the time when the reference voltage is
4 higher than the converted voltage to the time when the reference voltage is lower
5 than the converted voltage converges to 1.